6c) $y = \log_3 9^{\sin x}$

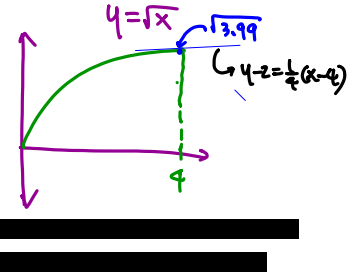
$= \log_3 3^{2\sin x} = 2\sin x$

$y' = 2\cos x$

$y = \log_3 9^{\sin x}$

$y' = \dfrac{1}{9^{\sin x}\ln 3} \cdot 9^{\sin x} \cdot \ln 9 \cdot \cos x$

Approximate $\sqrt{3.99}$



tang. line at (4,2)

$m = f'(4)$

$f(x)=\sqrt{x}$, $f'(x) = \left.\dfrac{1}{2\sqrt{x}}\right|_{x=4} = \dfrac{1}{4}$

$y-2 = \frac{1}{4}(x-4)$

$\frac{.01001}{4} = .0025$

$y = \left.\frac{1}{4}(x-4)+2\right|_{3.99=x} = \frac{1}{4}(3.99-4)+2$

$= -.0025 + 2$

$= 1.9975$

Approximate $\sqrt[3]{8.12}$

$y = x^{\frac{1}{3}}$ $y' = \frac{1}{3\sqrt[3]{x^2}}$

$f'(8) = \frac{1}{3\sqrt[3]{64}} = \frac{1}{3 \cdot 4} = \frac{1}{12}$

$f(8) = \sqrt[3]{8} = 2$

$y - 2 = \frac{1}{12}(x - 8)$ (8.12)

$y = .01 + 2$ $y = \frac{1}{12}(.12) + 2$

$y = 2.01$

Let $y = 2x^2 + 5x$

$\Delta x = .02$

at $x = 1$

What is Δy?

$y' = 4x + 5 \Big|_{x=1} = 9$

$y - y_0 = m(x - x_0)$

Δy $\quad$ $f'(x_0)$ $\quad$ Δx

$\Delta y = m(\Delta x)$

$= 9(.02)$

$= .18$

What is dy when $y = \sin(x) + x$ and $dx = .1$ at $x = \frac{\pi}{3}$?

$y' = \cos x + 1 \Big|_{x=\frac{\pi}{3}}$

$= 1.5$

$dy = 1.5\,dx = .15$